Sourcing Natural Food Colorants from Amaranth

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Color is an essential component of food and beverage products that influences consumer interest and overall product success. It can influence a product's flavor identity and intensity, perceived freshness, and overall quality. Synthetic dyes such as Red 40 have traditionally been the most commonly utilized food colorants, but recent consumer demands for healthier foods with simple ingredients have motivated a switch to natural, plant-derived colorants. In my research, I'm surveying a diverse selection of vegetable amaranth to determine its feasibility as a source of natural colorants. The leaves and stems contain three major classes of pigments that can be utilized as colorants: chlorophylls, carotenoids, and betalains. Betalains, which range from violet-red to yellow, are particularly important because their only current commercial source is from table beets— an expensive crop that has a distinct earthy odor. Amaranth is an appealing alternative because of its high biomass production and impressive color yields. My work focuses on determining the identity and yield of these pigments so that top-performing cultivars can be identified and tested further. This image is a glimpse of the fascinating range of phenotypes observed from the many different cultivars I've grown in greenhouse trials.